



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20591
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/091,945	03/05/2002	Chun-Chi Lee	JCLA6897	7088

7590
J.C. Patents, Inc.
Suite 250
4 Venture
Irvine, CA 92618

12/19/2002

EXAMINER

MITCHELL, JAMES M

ART UNIT

PAPER NUMBER

2827

DATE MAILED: 12/19/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/091,945

Examiner

James Mitchell

Applicant(s)

LEE ET AL.

Art Unit

2827

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 June 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau of the PCT (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the cavity within a heat spreader with a ground substrate formed on the heat spreader's substrate mount region must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or
(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

Claims 1 and 3-8 are rejected under 35 U.S.C. 102(e) as being anticipated by Aiquien et al. (U.S 2002/0163064).

Aiquien (2b) discloses a cavity down ball grid array packaging structure, comprising a heat spreader (10) including a chip mounting region at a cavity and a

substrate mounting region, a substrate (20) bounded to the heat spreader in the substrate mounting region, wherein the substrate comprises at least an insulating layer (24; Par. 0004, Line18), a patterned wiring layer (26) and a via (36) electrically connected to the heat spreader, said wiring layer comprises a ball pad (contact region below a ball, 40), a contact pad (contact region below a ball, 40) and a first ground pad (portion of 26 in contact with wire, 28) spaced apart from and electrically connected to the via, a chip (12) having an active surface and a corresponding back surface, the chip being bonded (via 18) in the chip mounting region of the heat spreader, wherein the active surface of the chip includes at least an inherent second contact pad (via wire contacting chip) and an inherent second ground pad (ground in chip) electrically connected to the first contact pad via wire (28), and a second ground pad electrically connected to the heat spreader (through via, 36), an encapsulant material (34) encapsulating the chip, the first and second contact pads, and a plurality of solder balls (40) attached to the ball pad and first ground pad; with the second ground connected to the heat spreader via a wire, and first and second contact pads connected via wire; with first ground pad connected to the via by ground wire (26).

Claims 1,2, 4-8 and 10-14 are rejected under 35 U.S.C. 102(e) as being anticipated by Mihara (JP 2000-332160).

Mihara (Fig 8) discloses a cavity down ball grid array packaging structure, comprising a heat spreader (203) including a chip mounting region at a central portion and a substrate mounting region located around the chip mounting region, a substrate (221) bounded to the heat spreader in the substrate mounting region, wherein the

substrate comprises at least an insulating layer (221), a patterned wiring layer (231a) and a via ("through hole", not labeled) electrically connected to the heat spreader via wire (not labeled), said wiring layer comprises a ball pad (contact region below a ball), a contact pad (contact region below a ball) and a ground pad (English Trans. Par. 0013) connected to conductive wiring spaced apart from and electrically connected to the via, said heat spreader includes a ground substrate (231b) having an opening exposing the heat spreader at the chip mounting region to form a cavity; said via contacts ground pad; a chip (201) having an active surface and a corresponding back surface, the chip being inherently bonded in the chip mounting region of the heat spreader, wherein the active surface of the chip includes at least an inherent second contact pad (via wire contacting chip) and an inherent second ground pad (ground in chip) electrically connected to the first contact pad via wire (209), and a second ground pad electrically connected to the heat spreader, an encapsulant material (211) encapsulating the chip, the first and second contact pads, and a plurality of solder balls (205) attached to the ball pad and first ground pad; with the second ground connected to the heat spreader via a wire, and first and second contact pads connected via wire; with first ground pad connected to the via by ground wire.

Claim Rejections - 35 USC § 103

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation

under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Aquien.

Although Aquien does not appear to explicitly teach the process limitations of "disposing a conductive ball in a via opening and reflowing the conductive ball to form a conductive filling," the product of Aquien inherently possesses the structural characteristics imparted by the process limitation. See *In re Fitzgerald, Sanders, and Bagheri*, 205 USPQ 594 (CCPA 1980).

Claims 4, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mihara.

Mihara does not appear to disclose a chip mounted in a cavity formed with the heat spreader, however examiner takes official notice that it would have been obvious to one of ordinary skill in the art to form a cavity in the spreader for alignment of the chip during chip mount.

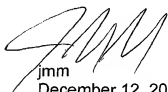
With respect to claim 9, although Mihara does not appear to explicitly teach the process limitations of "disposing a conductive ball in a via opening and reflowing the conductive ball to form a conductive filling," the product of Aquien inherently possesses the structural characteristics imparted by the process limitation. See *In re Fitzgerald, Sanders, and Bagheri*, 205 USPQ 594 (CCPA 1980).


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James Mitchell whose telephone number is (703) 305-0244. The examiner can normally be reached on M-F 10:30-8:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L. Talbott can be reached on (703) 305-9883. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-3432 for regular communications and (703) 305-3230 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.


jmm
December 12, 2002


ALBERT W. PALADINI
PRIMARY EXAMINER